Abstract

The aim of this work is to determine shrinkage and distortion in Near Net Process components, in particular castings In this work, **Medial Axis Transform(MAT)** has been applied for analysis, perhaps for the first time Through MAT an unique representation of the object is obtained An algorithm to generate MAT for objects of different shapes has been developed and tested for typical objects Straight edges, curved sections including NonUniform rational B-splines(NURBS) and multiply-connected sections(objects with holes) are handled From the MAT its **central axis** is identified based on some new definitions

Shrinkage and distortion in a component are determined from its central axis Boundary representation of the object is the input and the output is the part incorporating allowance for shrinkage and distortion This approach facilitates **automatic application** of allowances in the design of castings and its tooling moulds, dies and cores in manufacture This method enhances the geometric integrity and dimensional stability at the design stage and enables closer tolerances with reduced post processing in manufacturing This also reduces the weight of a component to a logical minimum to derive energy economy Reliance on expertise and experience of methoding engineers on their application of a number of heuristics that could lead to erroneous tool geometry is minimised